NATIONAL BUREAU OF STANDARDS REPORT

9350 SUPPLEMENTARY

PHOTOMETRIC CHARACTERISTICS OF U. S. CARRIER DECK LIGHTS

NBS

U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards[1] was established by an act of Congress March 3, 1901. Today, in addition to serving as the Nation's central measurement laboratory, the Bureau is a principal focal point in the Federal Government for assuring maximum application of the physical and engineering sciences to the advancement of technology in industry and commerce. To this end the Bureau conducts research and provides central national services in three broad program areas and provides central national services in a fourth. These are: (1) basic measurements and standards, (2) materials measurements and standards, (3) technological measurements and standards, and (4) transfer of technology.

The Bureau comprises the Institute for Basic Standards, the Institute for Materials Research, the Institute for Applied Technology, and the Center for Radiation Research.

THE INSTITUTE FOR BASIC STANDARDS provides the central basis within the United States of a complete and consistent system of physical measurement, coordinates that system with the measurement systems of other nations, and furnishes essential services leading to accurate and uniform physical measurements throughout the Nation's scientific community, industry, and commerce. The Institute consists of an Office of Standard Reference Data and a group of divisions organized by the following areas of science and engineering:

> Applied Mathematics—Electricity—Metrology—Mechanics—Heat—Atomic Physics—Cryogenics[2]—Radio Physics[2]—Radio Engineering[2]—Astrophysics[2]—Time and Frequency.[2]

THE INSTITUTE FOR MATERIALS RESEARCH conducts materials research leading to methods, standards of measurement, and data needed by industry, commerce, educational institutions, and government. The Institute also provides advisory and research services to other government agencies. The Institute consists of an Office of Standard Reference Materials and a group of divisions organized by the following areas of materials research:

> Analytical Chemistry—Polymers—Metallurgy — Inorganic Materials — Physical Chemistry.

THE INSTITUTE FOR APPLIED TECHNOLOGY provides for the creation of appropriate opportunities for the use and application of technology within the Federal Government and within the civilian sector of American industry. The primary functions of the Institute may be broadly classified as programs relating to technological measurements and standards and techniques for the transfer of technology. The Institute consists of a Clearinghouse for Scientific and Technical Information,[3] a Center for Computer Sciences and Technology, and a group of technical divisions and offices organized by the following fields of technology:

> Building Research—Electronic Instrumentation — Technical Analysis — Product Evaluation—Invention and Innovation— Weights and Measures — Engineering Standards—Vehicle Systems Research.

THE CENTER FOR RADIATION RESEARCH engages in research, measurement, and application of radiation to the solution of Bureau mission problems and the problems of other agencies and institutions. The Center for Radiation Research consists of the following divisions:

> Reactor Radiation—Linac Radiation—Applied Radiation—Nuclear Radiation.

---

[1] Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D. C. 20234.

[2] Located at Boulder, Colorado 80302.

[3] Located at 5285 Port Royal Road, Springfield, Virginia 22151.

NATIONAL BUREAU OF STANDARDS REPORT

NBS PROJECT
2120414

June 1968

NBS REPORT
9350 Supplementary

PHOTOMETRIC CHARACTERISTICS OF U. S. CARRIER DECK LIGHTS

by

A. C. Wall

For

Naval Air Systems Command
Department of the Navy
Washington, D. C.

IMPORTANT NOTICE

NATIONAL BUREAU OF STAN
for use within the Government. Bef
and review. For this reason, the pu
whole or in part, is not authorizec
Bureau of Standards, Washington, I
the Report has been specifically pre

Approved for public release by the director of the National Institute of Standards and Technology (NIST) on October 9, 2015

accounting documents intended
bjected to additional evaluation
ting of this Report, either in
ffice of the Director, National
he Government agency for which
es for its own use.

NBS

U.S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

9350
Supplementary

Photometric Characteristics of U. S. Carrier Deck Lights

By
A. C. Wall

1. INTRODUCTION

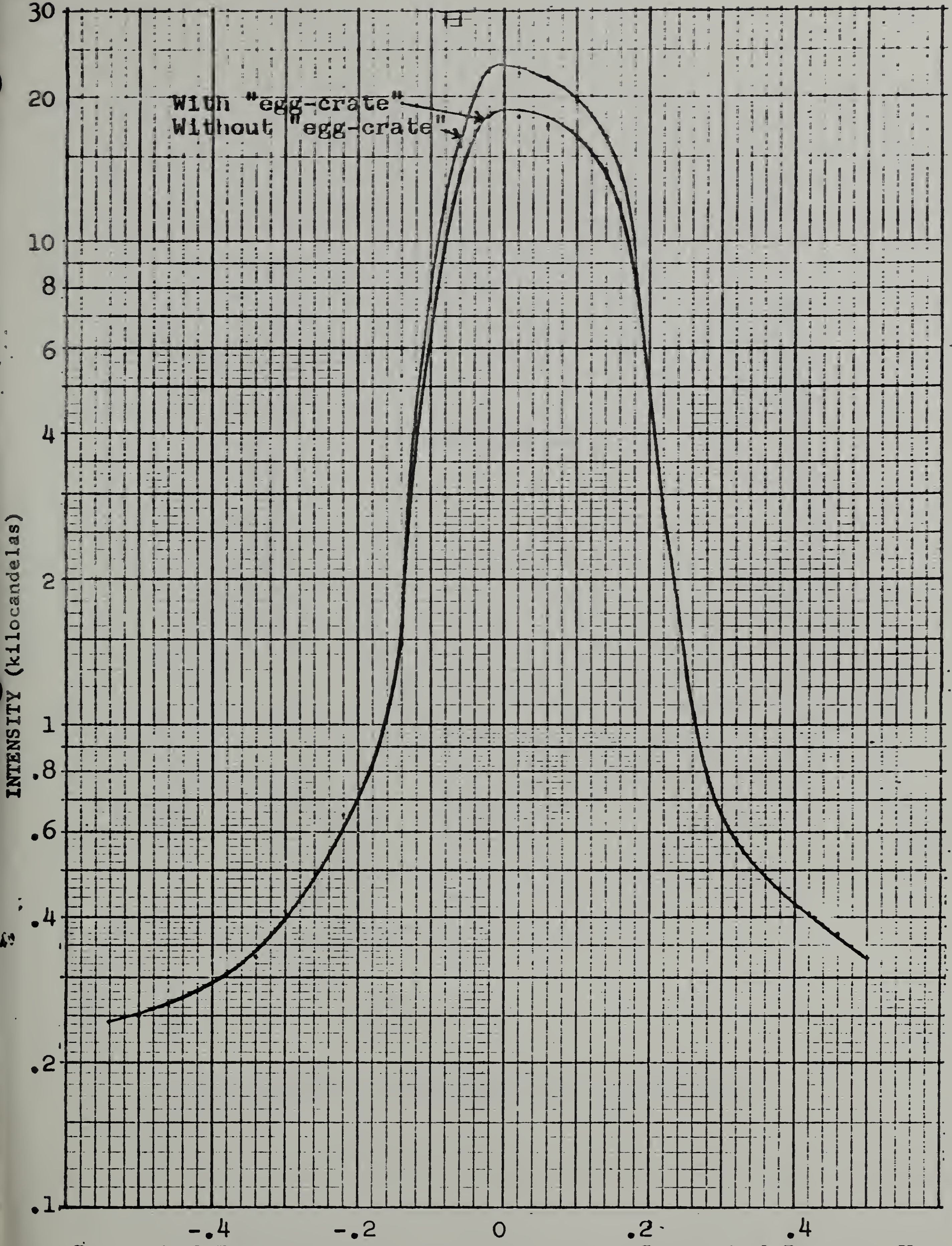
The Photometry Section of the National Bureau of Standards has made photometric measurements of carrier deck lights since the early days of night flying. The results of these tests have usually been reported in NBS test reports. Many of these reports are no longer readily available although the lights described are still in service. This report has been prepared to present in readily available form intensity distributions of the carrier deck lights currently in use. Photographs of many of these lights have been included to assist in identification.

Index of Figures

Light Type	Figure Number		NBS Test Report Number
	Intensity Distribution	Photograph	
Fresnel Lens Optical Landing System (one cell)	1, 2	16	212. 11P-27/65
Carrier Homing Beacon	3	17	-
Night Vision Flood Light			
14-inch hood, clear window			
Specular reflector, Type 328A	4	19	21P-49/63
Specular reflector, Type 325A	10	18	21P-49/63
14-inch hood, spread lens			
Corrugated reflector, Type 325A	7	18	21P-49/63
Corrugated reflector, Type 328A	9	19	21P-49/63
24-inch hood, clear window			
Specular reflector, Type 326A	6	18	21P-49/63
Specular reflector, Type 329A	8	19	21P-49/63
24-inch hood, spread lens			
Specular reflector, Type 326A	5	18	21P-49/63
Corrugated reflector, Type 329A	11	19	21P-49/63
AA-1 Glide Slope Indicator	12, 13	20	21P-4/59
Deck Guide Light 45-watt	14	21	21P-65/61
100-watt	15	21	21P-65/61

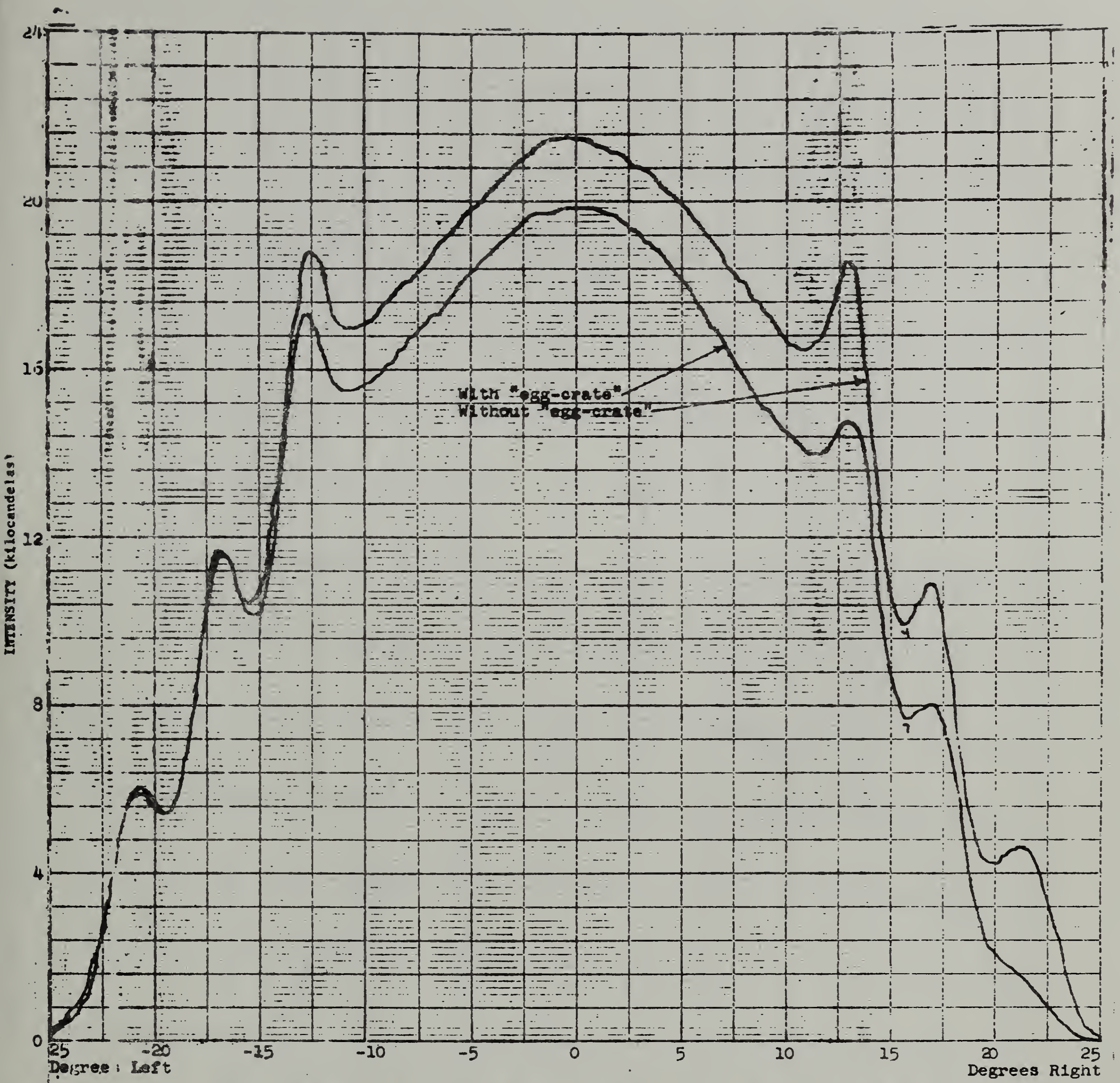
Light Type	Operating Volts or Amperes	Power (watts)	Flash Frequency and Duration	Design Location of Peak		Peak Intensity (kilocandelas)		Beam Sp
				Horizontal (degrees)	Vertical (degrees)			Horizont (degree
Fresnel Lens Optical Landing System (one cell)	21. 5 V	3 at 150	---	0. 0	Adjustable	20		32
Carrier Homing Beacon	32 V	150	80. fpm/50ms	---	0. 0	3		---
Night Vision Flood Light								
14-inch hood, clear window								
Specular reflector, Type 328A	6. 6 A	2 at 250	---	---	Adjustable	84		7. 4
Specular reflector, Type 325A	6. 6 A	200	---	---	Adjustable	36		7
14-inch hood, spread lens								
Corrugated reflector, Type 325A	6. 6 A	200	---	---	Adjustable	38		43
Corrugated reflector, Type 328A	6. 6 A	2 at 250	---	---	Adjustable	14		42
24-inch hood, clear window								
Specular reflector, Type 326A	6. 6 A	200	---	---	Adjustable	38		7
Specular reflector, Type 329A	6. 6 A	2 at 250	---	---	Adjustable	83		7. 4
24-inch hood, spread lens								
Specular reflector, Type 326A	6. 6 A	200	---	---	Adjustable	8		43
Corrugated reflector, Type 329A	6. 6 A	2 at 250	---	---	Adjustable	15		43
Type AA-1 Glide Slope Indicator	5. 95 V	3	---	0. 0	Adjustable	. 047	yellow	14
							green	15
Deck Guide Light	6. 6 A	45	---	0. 0	4°	.180	red	15.
	6. 6 A	100	---	0. 0	4°	.650		30
								27

Beam Spread (50% of peak)		Beam Spread (10% of peak)				Lamp	Figure
Horizontal (degrees)	Vertical (degrees)	Horizontal (degrees)	Vertical (degrees)	Beam Shape	Lamp Used	Life (Hours)	Numbers
32	0. 26	43	0. 38	Rectangle	DCA	10	1, 2, 16
---	8	---	---	360° fan	150PAR46/1	800	3, 17
7. 4	3. 5	15	7. 5	Rectangle	6. 6A/PAR56/4	1000	4, 19
7	3	13	6	Rectangle	200PAR46/6. 6	500	10, 18
43	3. 7	53	6. 5	Rectangle	200PAR46/6. 6	500	7, 18
42	4	52	7	Rectangle	6. 6A/PAR56/4	1000	9, 19
7	3	13	5	Rectangle	200PAR46/6. 6	500	6, 18
7. 4	3. 2	15	7	Rectangle	6. 6A/PAR56/4	1000	8, 19
43	3	53	6	Rectangle	200PAR46/6. 6	500	5, 18
43	3. 3	55	7. 4	Rectangle	6. 6A/PAR56/4	1000	11, 19
yellow 14	2. 5	15. 5	3	Oval	PR12	15	12, 13, 20
green 15	4. 7	16	5				
red 15. 5	7. 5	15. 5	8				
30	9	34	31	Oval	Q6. 6A/T2$\frac{1}{2}$/CL	1000	14, 21
27	7. 5	31	22. 5	Oval	Q6. 6A/T3/CL	1000	15, 21

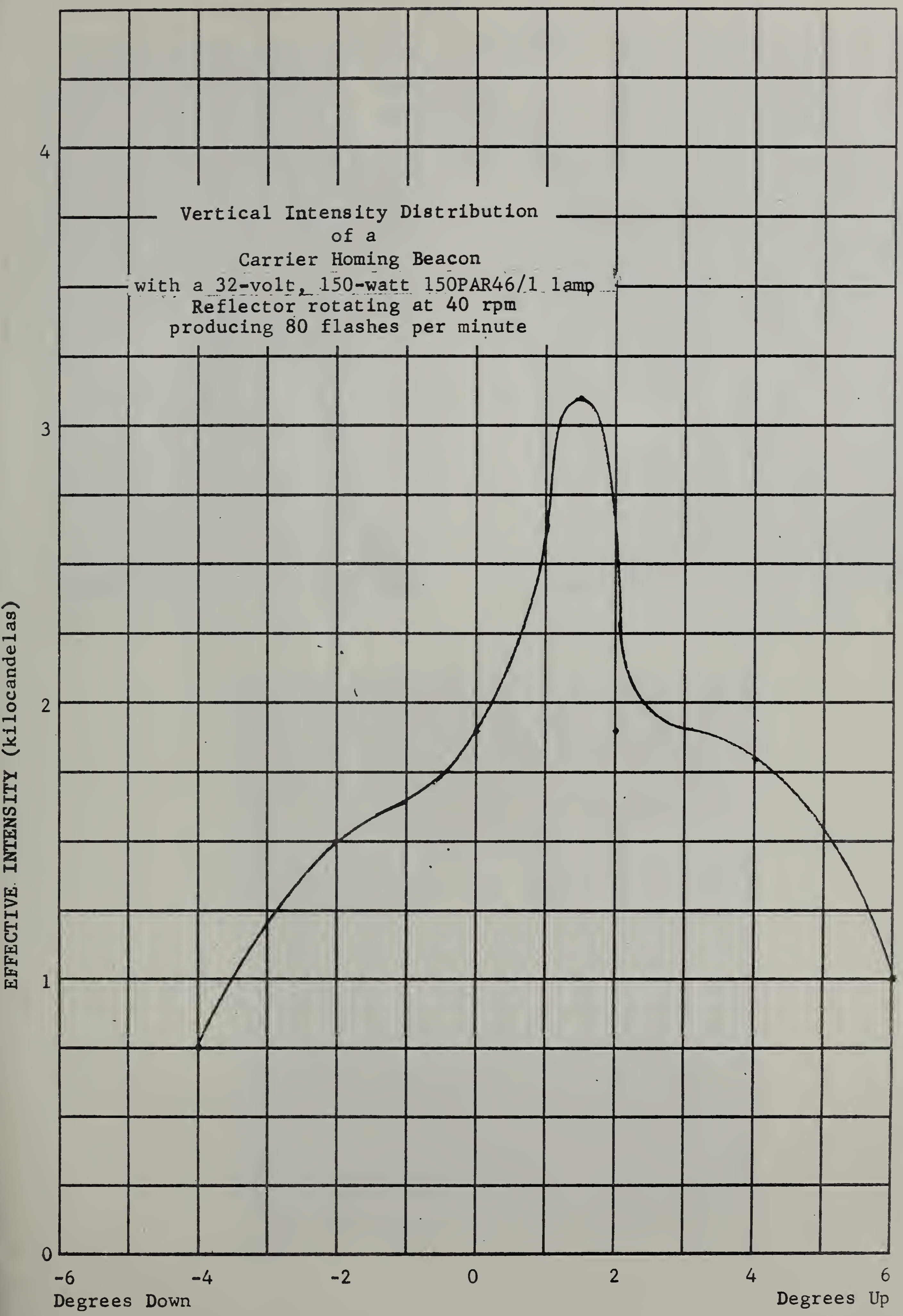


Vertical intensity distributions through 0 degrees horizontal of one cell of a Source-Light Indicator System Assembly of the Mark 6 Fresnel-Lens Optical Landing System.

Figure 1



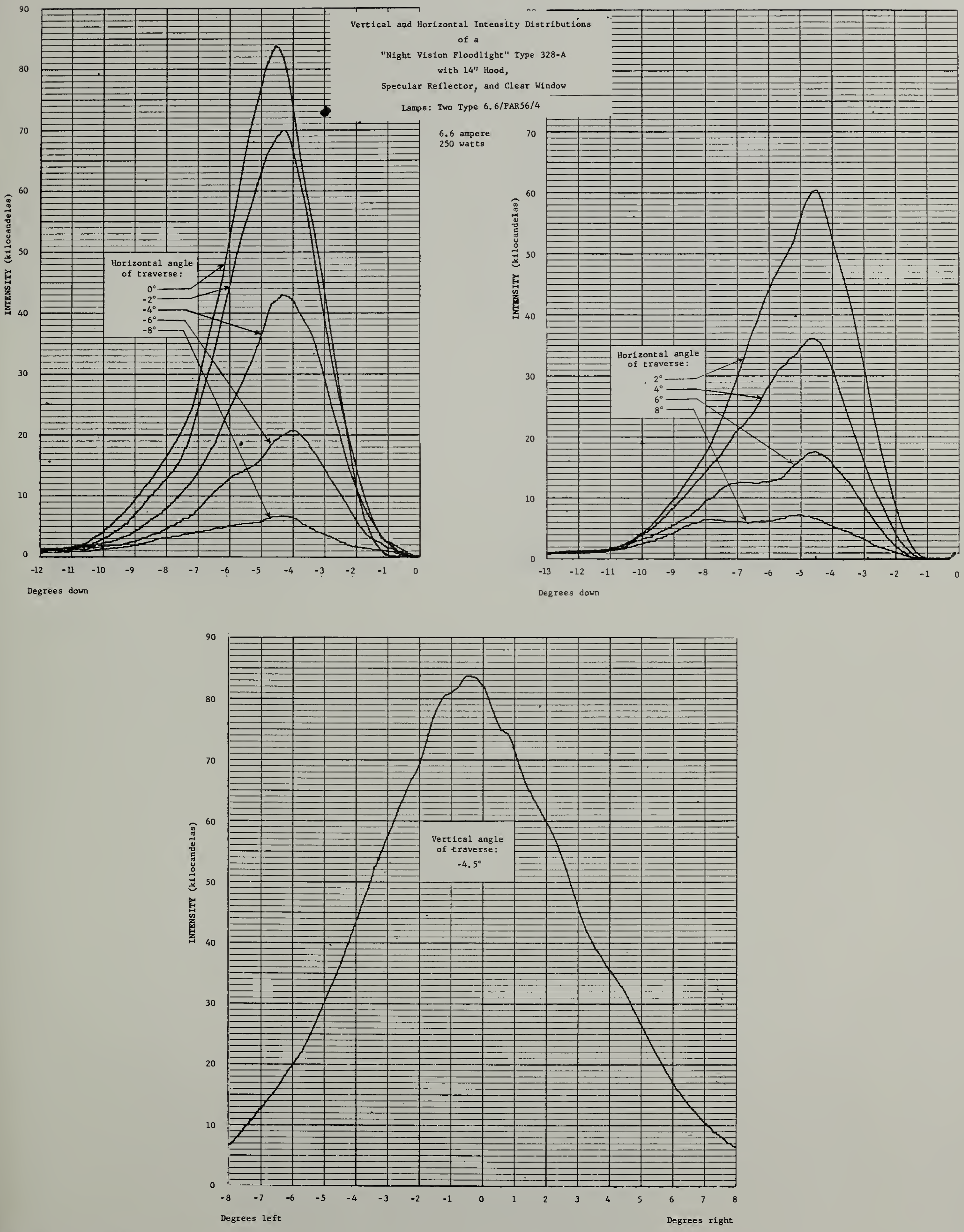
Horizontal intensity distributions through the vertical peak of one cell of a Source-Light Indicator System Assembly of the Mark 6 Fresnel-Lens Optical Landing System.



Vertical Intensity Distribution
of a
Carrier Homing Beacon
with a 32-volt, 150-watt 150PAR46/1 lamp
Reflector rotating at 40 rpm
producing 80 flashes per minute

NBS Report 9350 Supplementary

Figure 3



Vertical and Horizontal Intensity Distributions
of a
"Night Vision Floodlight" Type 328-A
with 14" Hood,
Specular Reflector, and Clear Window

Lamps: Two Type 6.6/PAR56/4

6.6 ampere
250 watts

Figure 4

Vertical and Horizontal Intensity Distributions
of a
"Night Vision Floodlight" Type 326-A
with 24" Hood,
Corrugated Reflector, and Spread Lens Window

Lamp: Type 200PAR46/6.6

6.6 ampere
200 watts

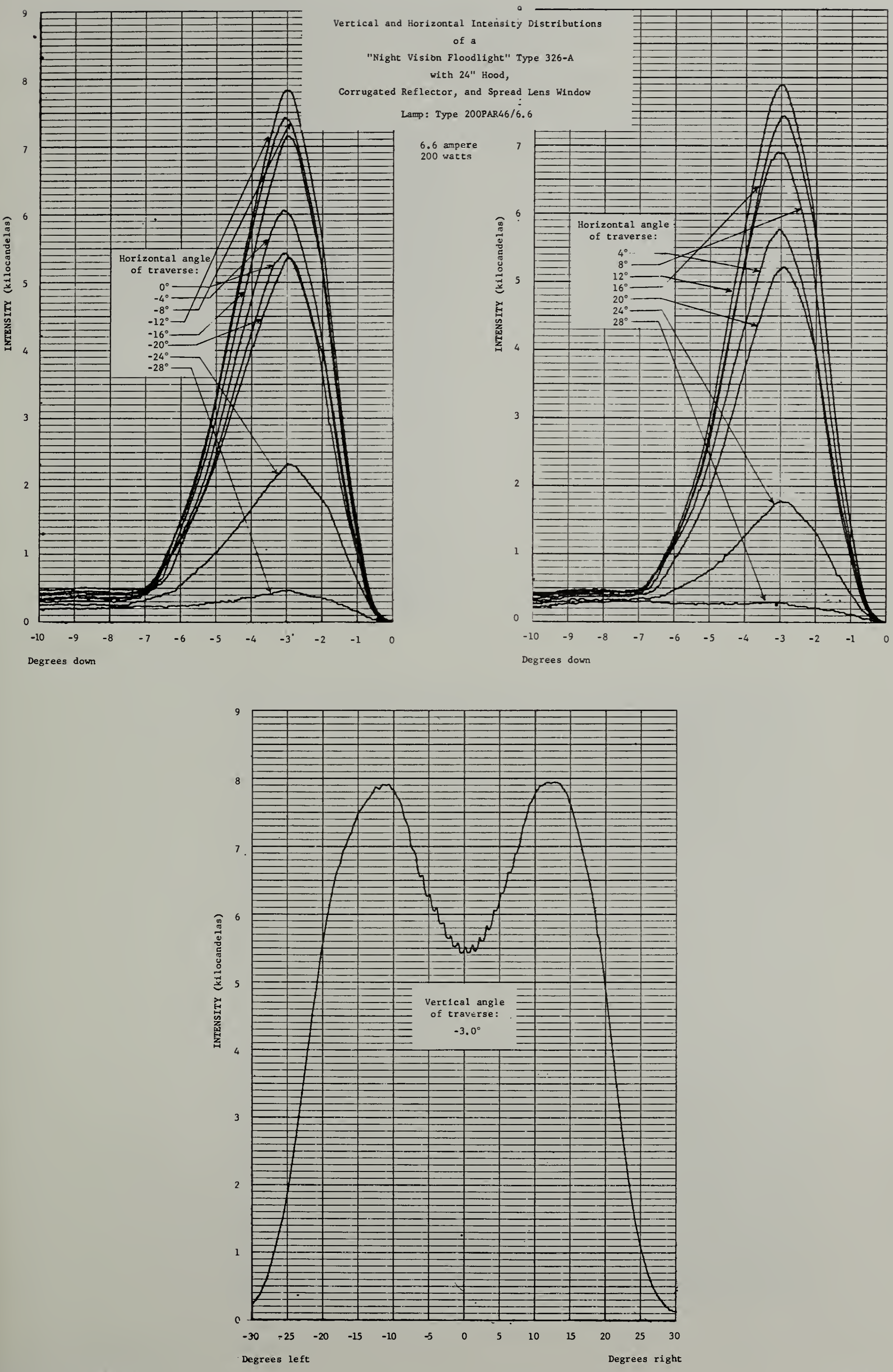
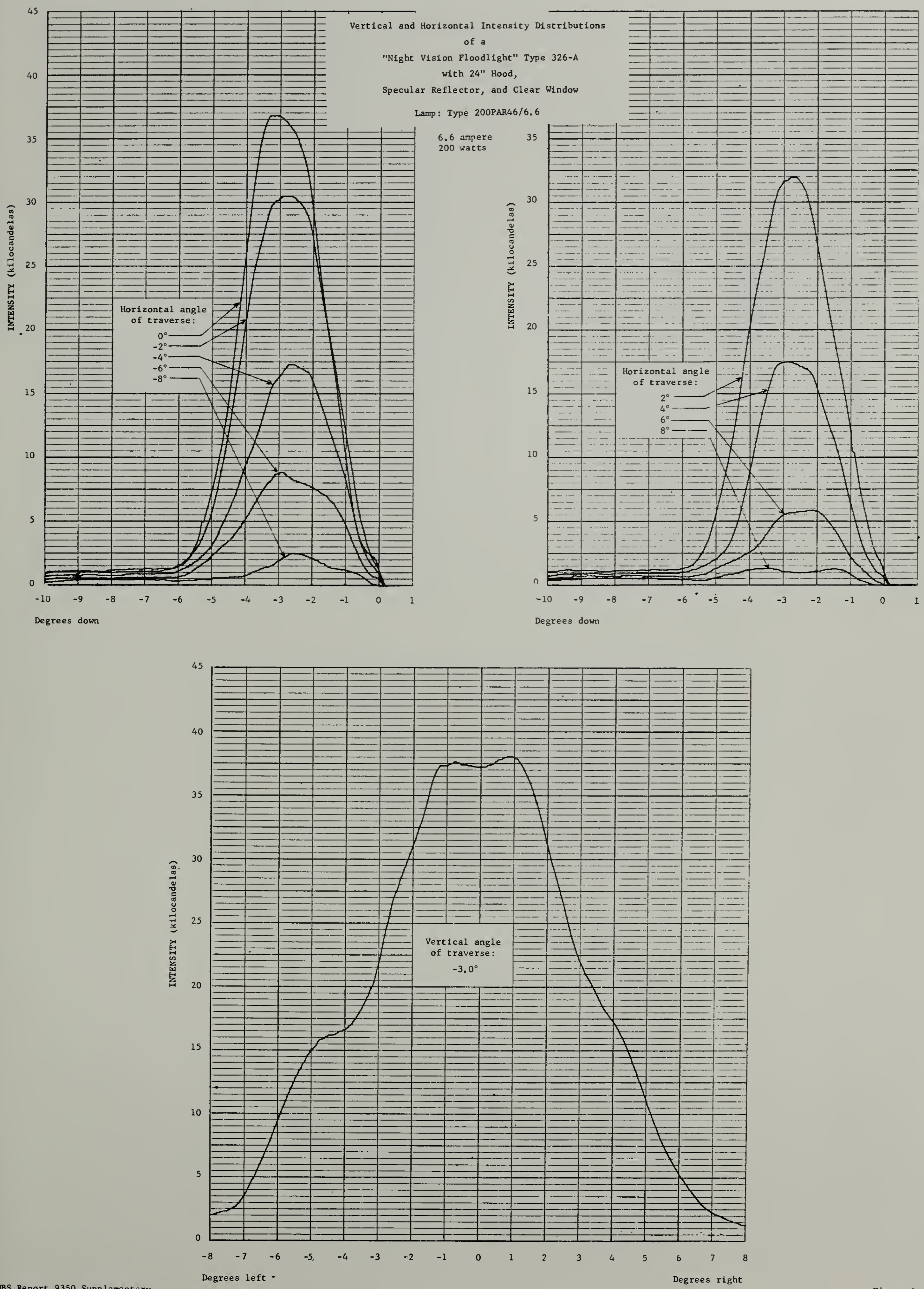


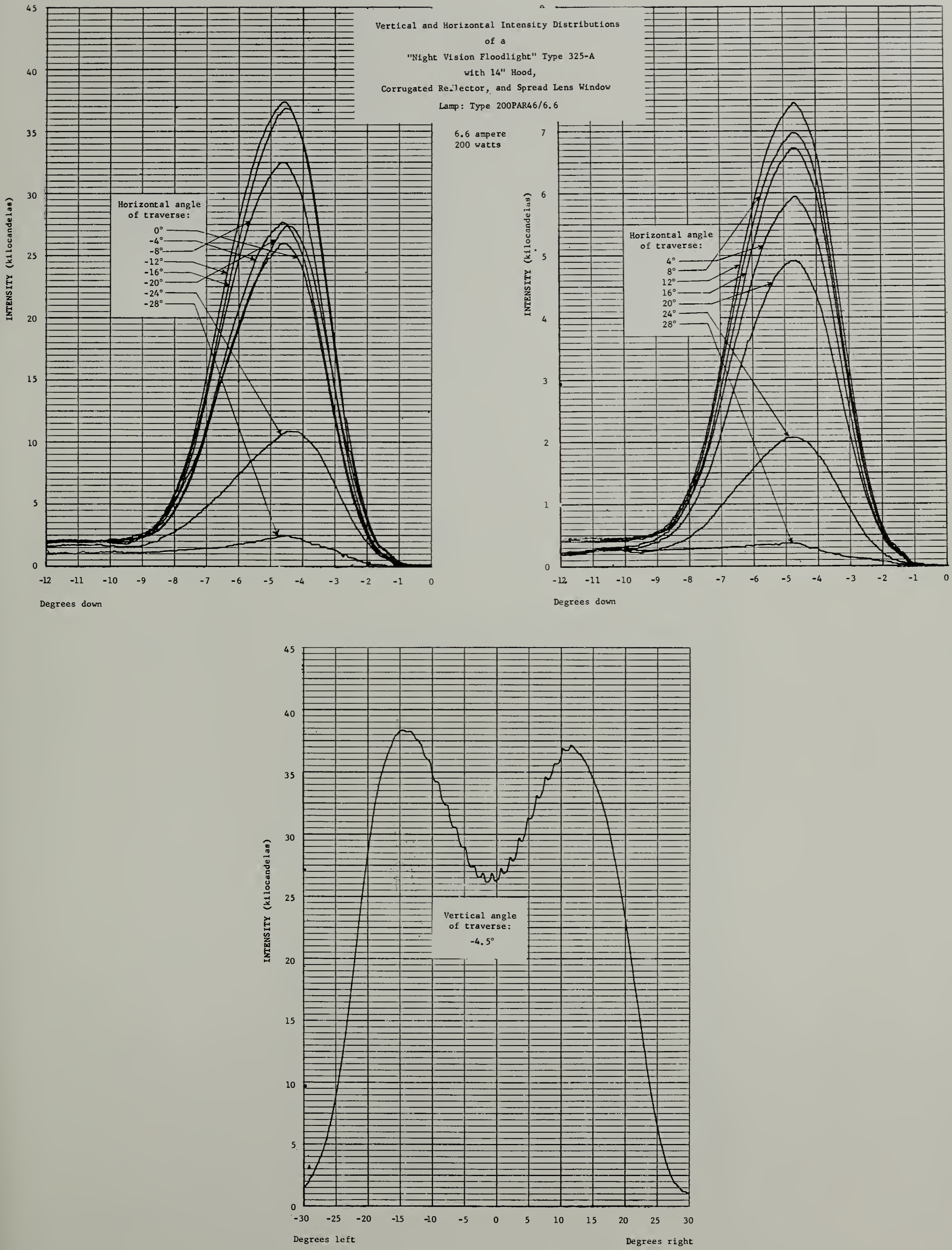
Figure 5


Vertical and Horizontal Intensity Distributions
of a
"Night Vision Floodlight" Type 326-A
with 24" Hood,
Specular Reflector, and Clear Window

Lamp: Type 200PAR46/6.6

6.6 ampere
200 watts

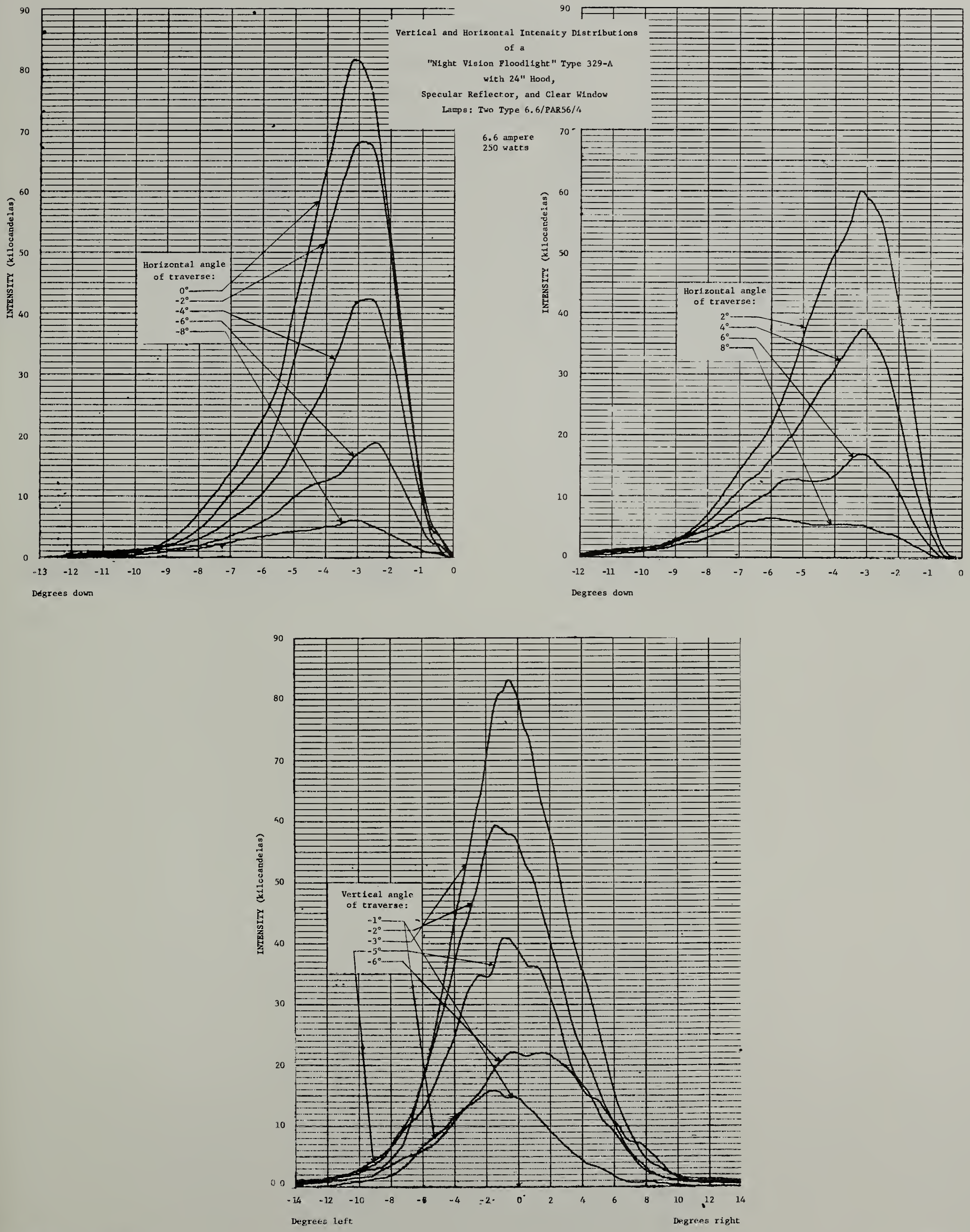
Figure 6



Vertical and Horizontal Intensity Distributions
of a
"Night Vision Floodlight" Type 325-A
with 14" Hood,
Corrugated Reflector, and Spread Lens Window
Lamp: Type 200PAR46/6.6

6.6 ampere
200 watts

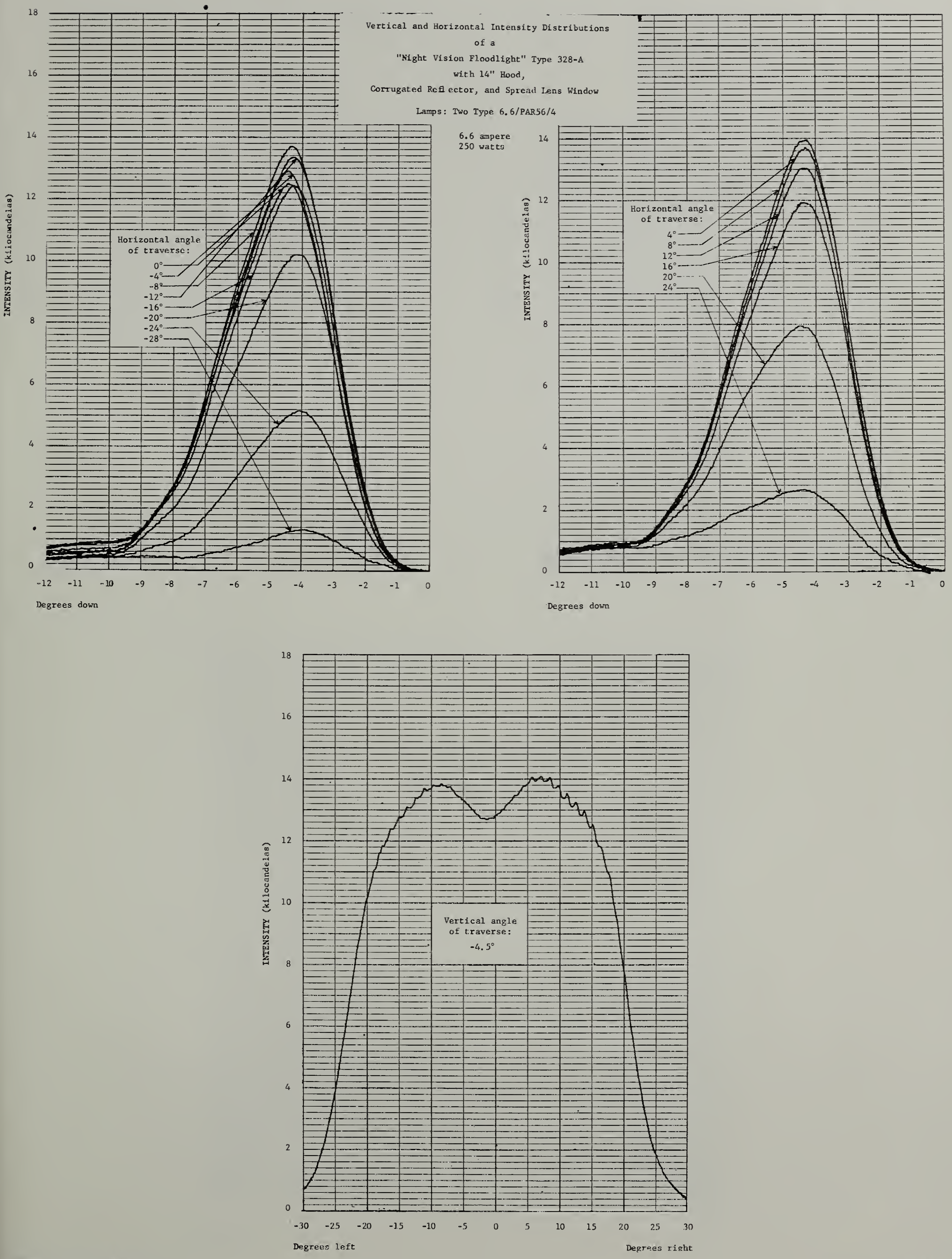
Figure 7



Vertical and Horizontal Intensity Distributions
of a
"Night Vision Floodlight" Type 329-A
with 24" Hood,
Specular Reflector, and Clear Window
Lamps: Two Type 6.6/PAR56/4

6.6 ampere
250 watts

Figure 8



Vertical and Horizontal Intensity Distributions
of a
"Night Vision Floodlight" Type 328-A
with 14" Hood,
Corrugated Reflector, and Spread Lens Window

Lamps: Two Type 6.6/PAR56/4

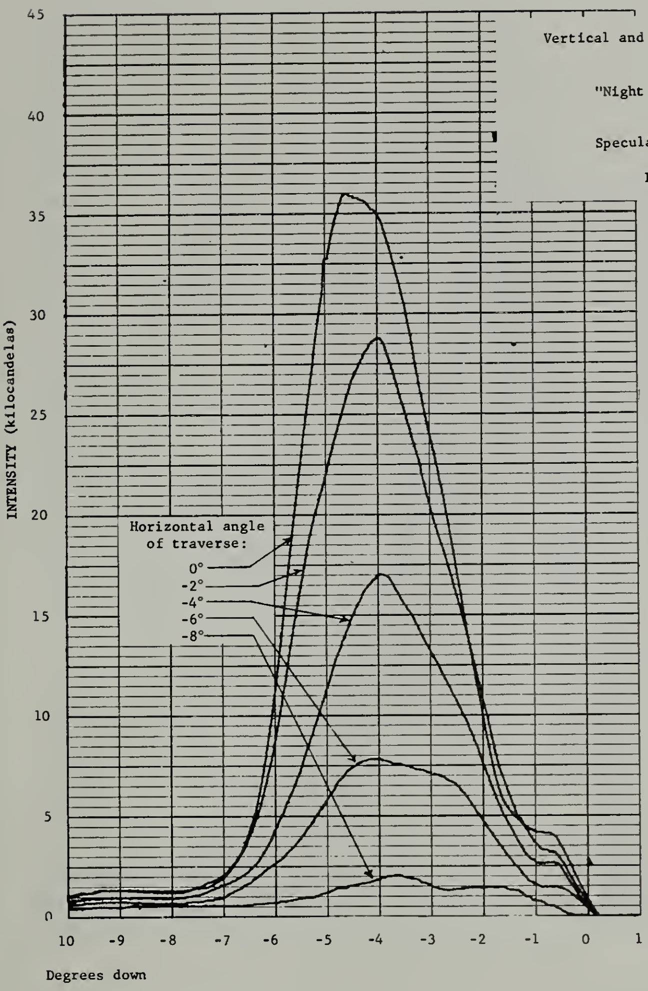
6.6 ampere
250 watts

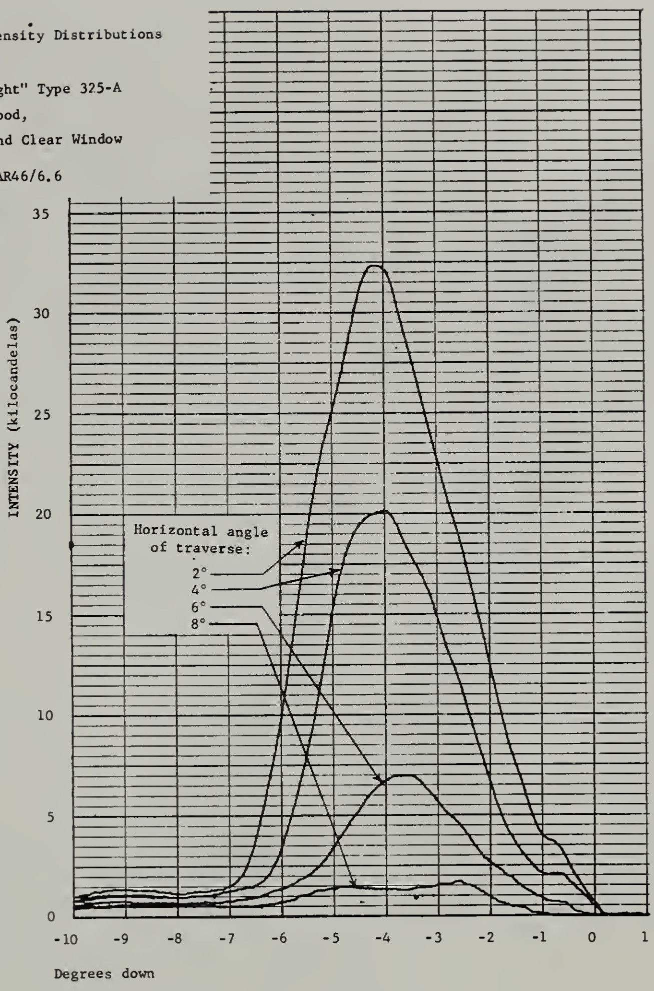
Figure 9

Vertical and Horizontal Intensity Distributions
of a
"Night Vision Floodlight" Type 325-A
with 14" Hood,
Specular Reflector, and Clear Window

Lamp: Type 200PAR46/6.6

6.6 ampere
200 watts





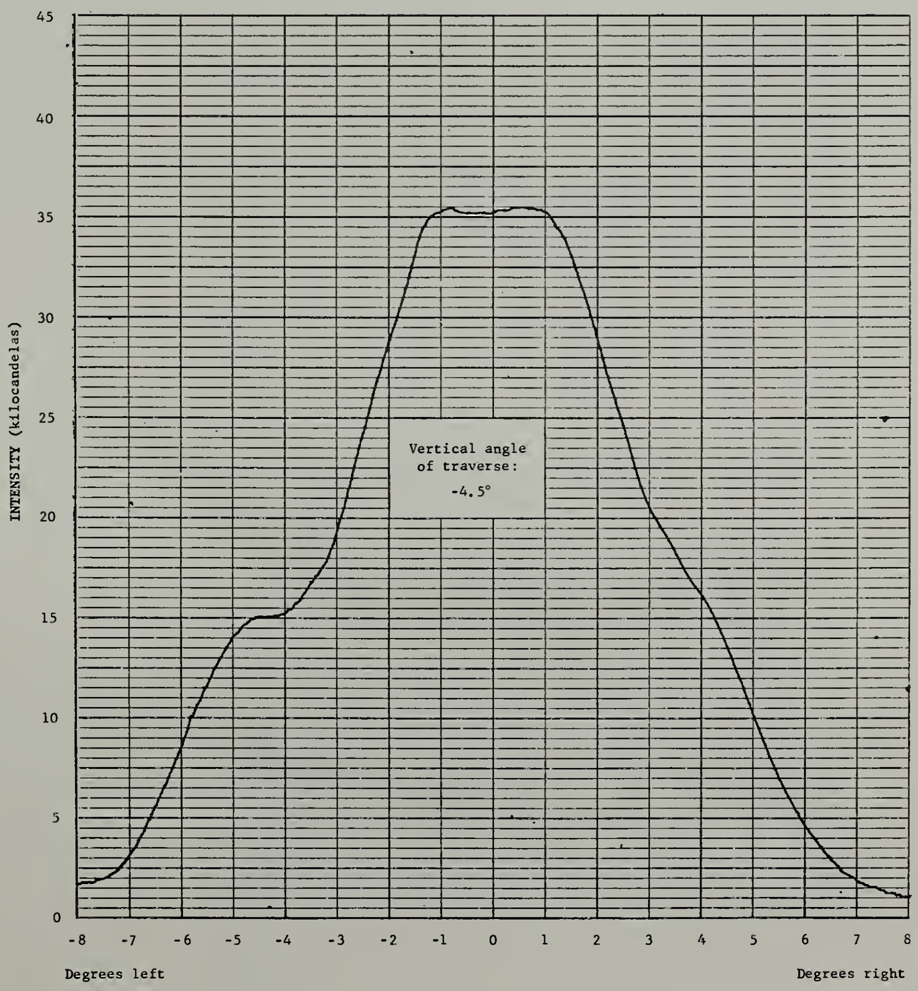
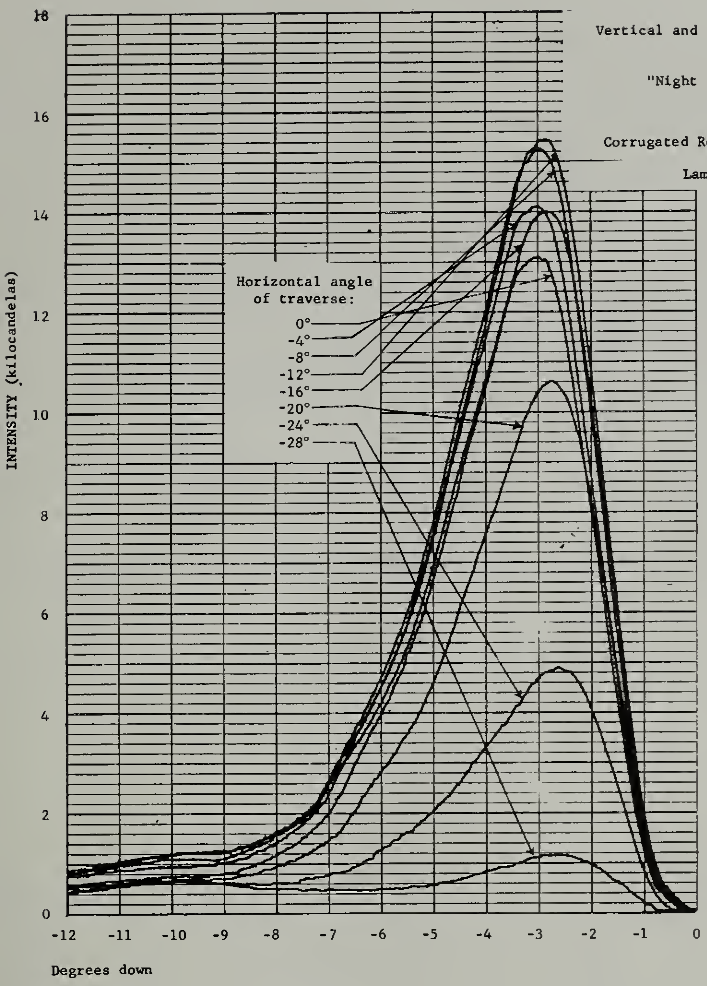
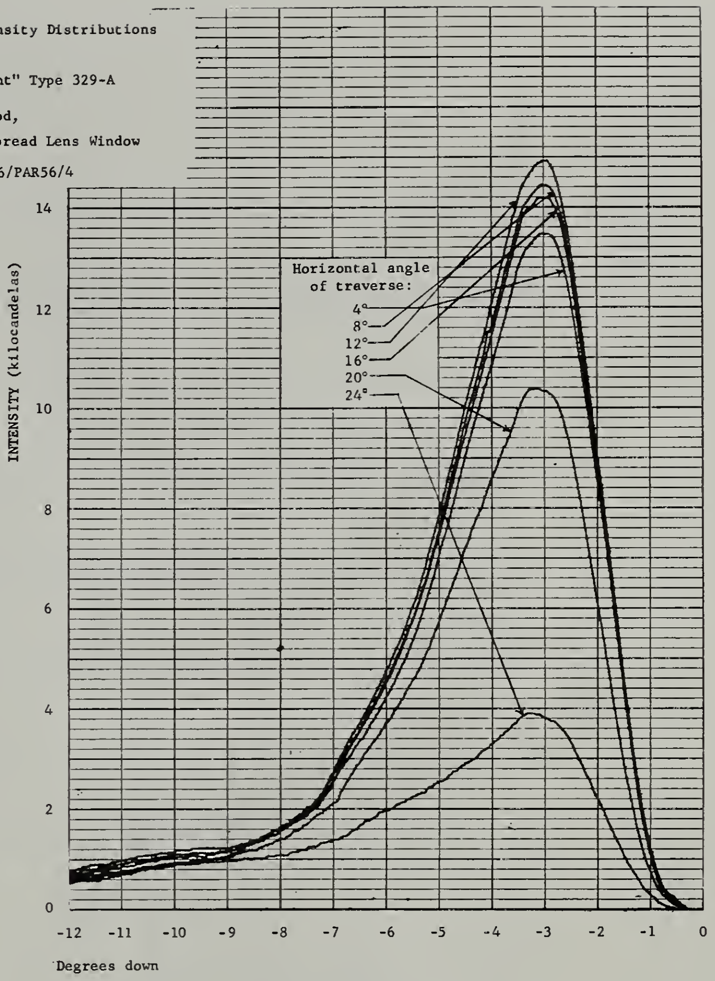


Figure 10

Vertical and Horizontal Intensity Distributions
of a
"Night Vision Floodlight" Type 329-A
with 24" Hood,
Corrugated Reflector, and Spread Lens Window
Lamps: Two Type 6.6/PAR56/4
6.6 ampere
250 watts





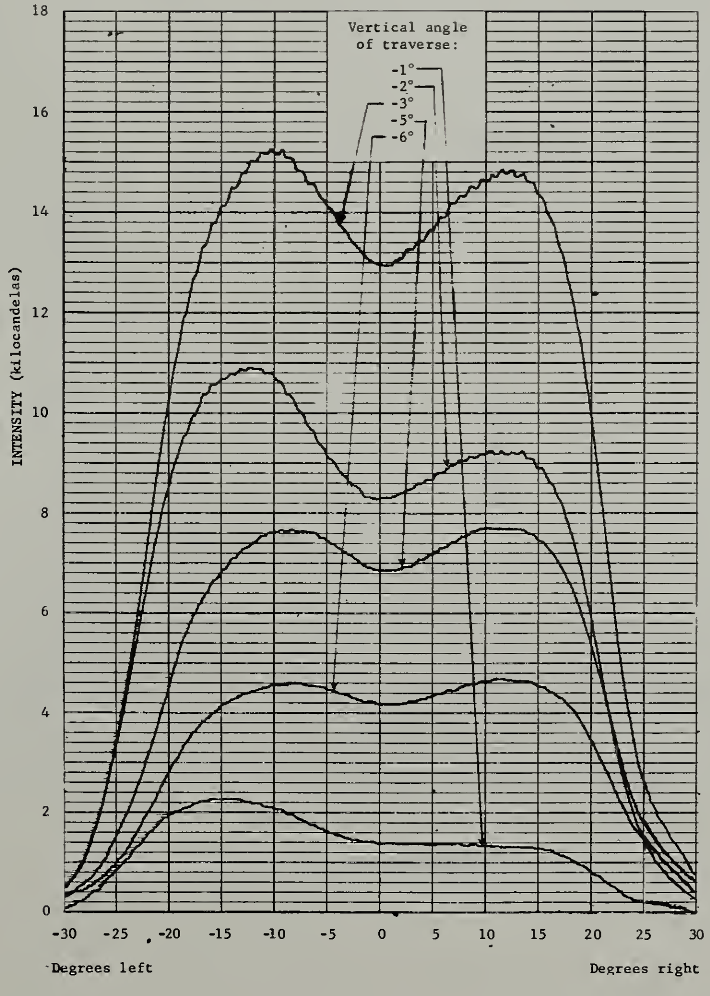
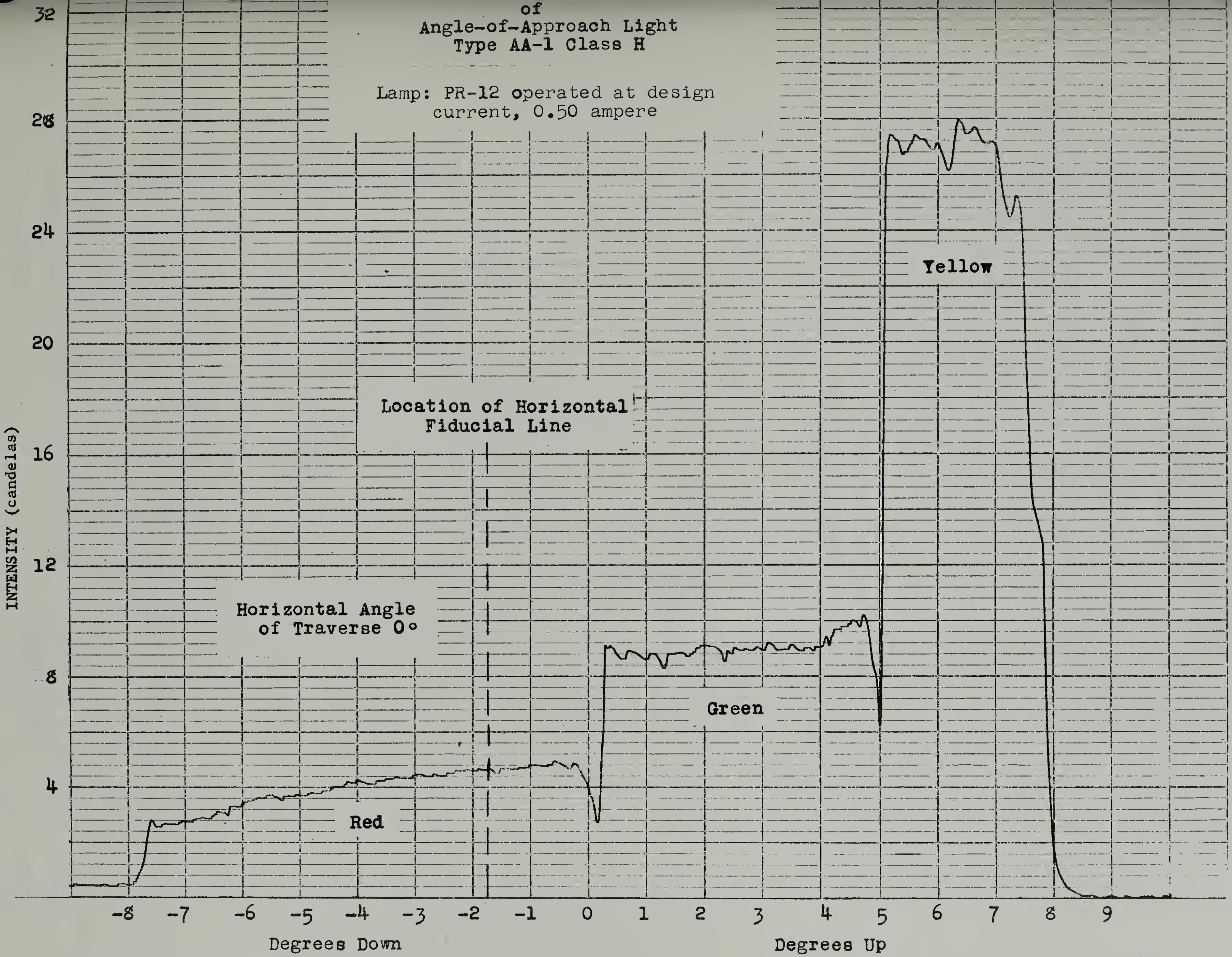


Figure 11



of
Angle-of-Approach Light
Type AA-1 Class H

Lamp: PR-12 operated at design current, 0.50 ampere

Figure 12

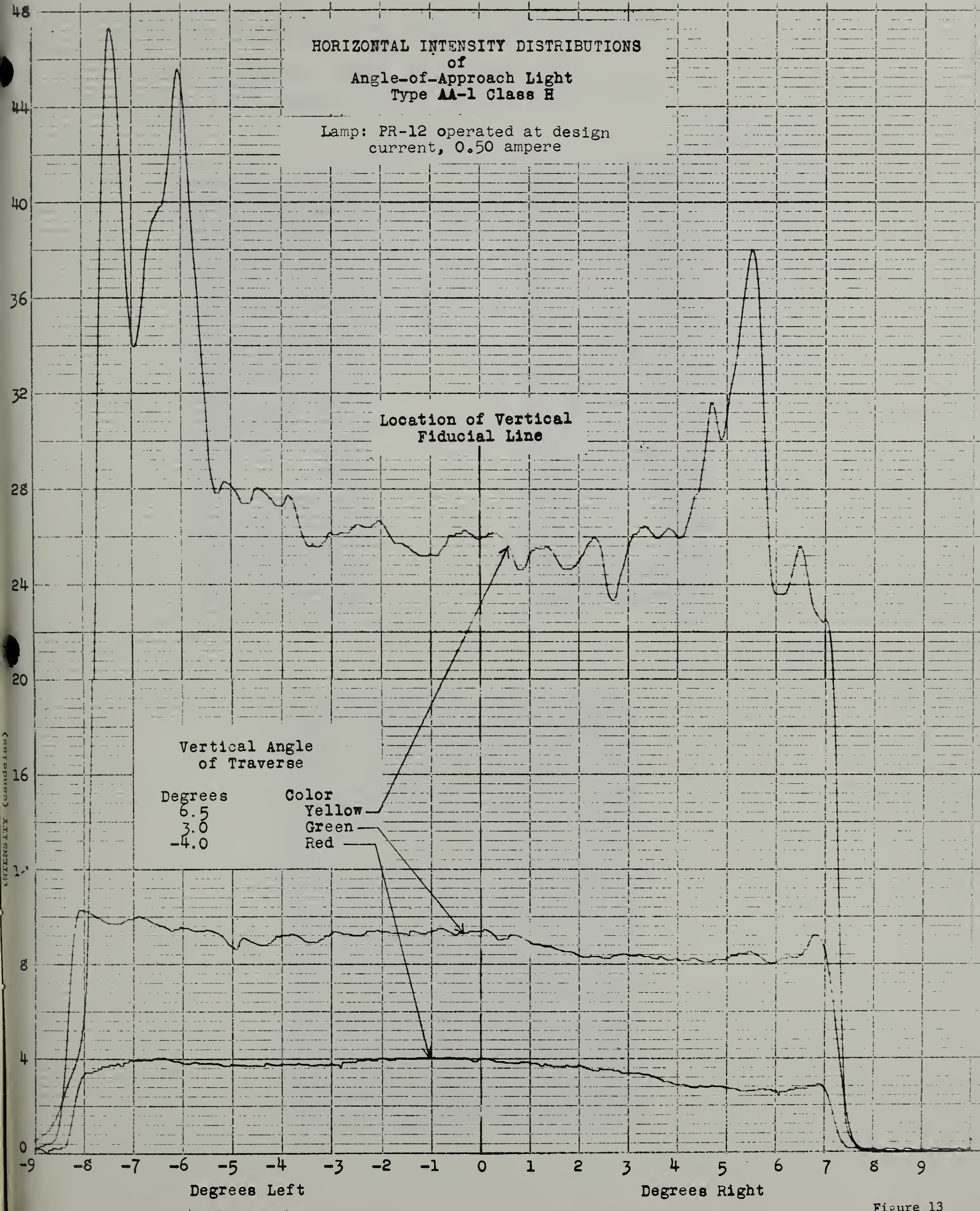
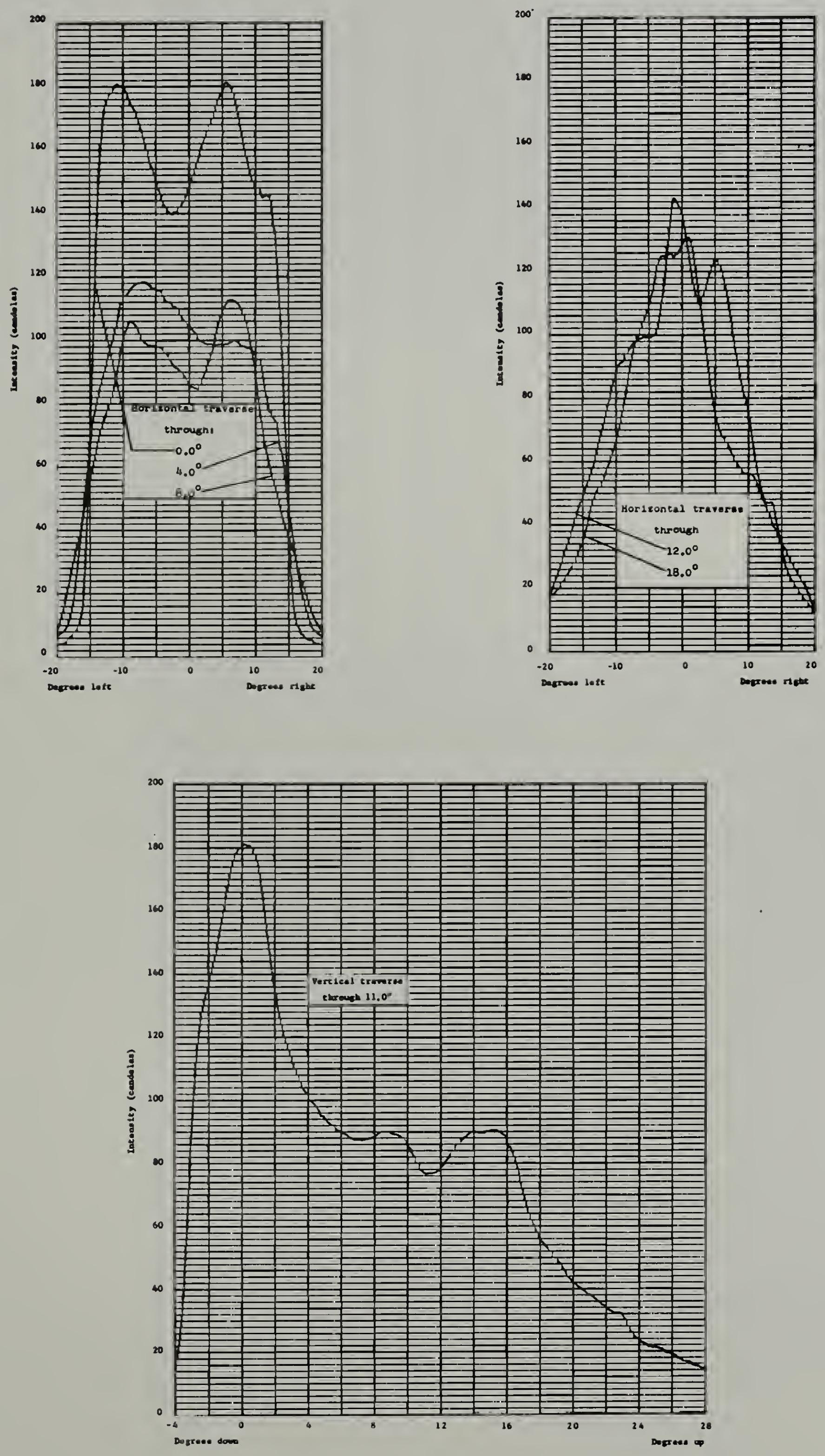

HORIZONTAL INTENSITY DISTRIBUTIONS
of
Angle-of-Approach Light
Type AA-1 Class H
Lamp: PR-12 operated at design
current, 0.50 ampere
Location of Vertical
Fiducial Line
Vertical Angle
of Traverse
Degrees
6.5
3.0
-4.0
Color
Yellow
Green
Red
INTENSITY (candelas)
48
44
40
36
32
28
24
20
16
12
8
4
0
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
7
8
9
Degrees Left
Degrees Right

Figure 13

Vertical and Horizontal intensity Distributions
of a
Deck Guide Light, L.C.D. No. 366
with a 6.6-ampere, 45-watt Q6.6A/T$2\frac{1}{2}$/Cl lamp



NBS Report 9350 Supplementary

Figure 14

Vertical and Horizontal Intensity Distributions
of a
Deck Guide Light, L.C.D. No. 366
with a 6.6-ampere, 100-watt Q6.6A/T3/Cl lamp

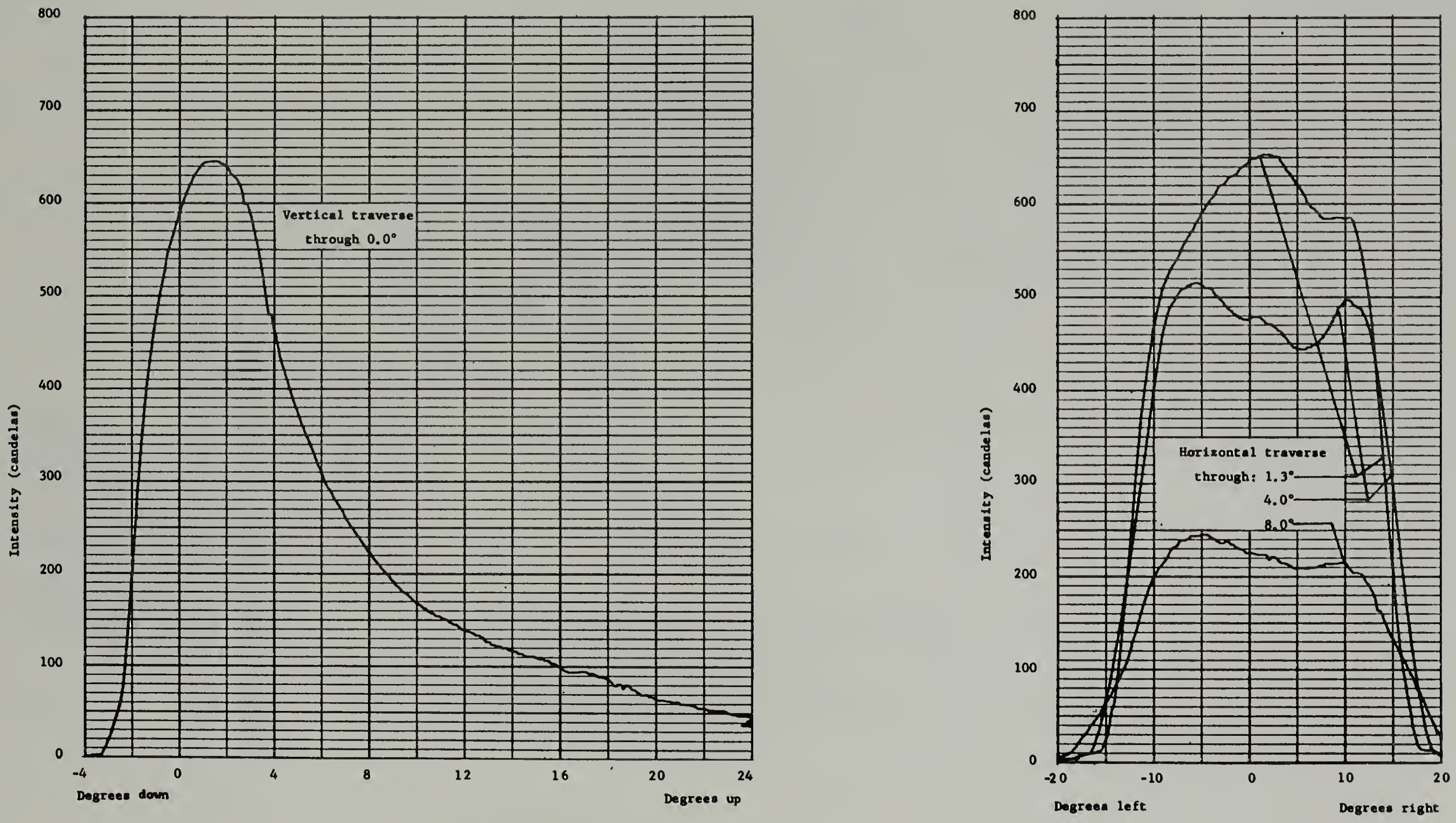
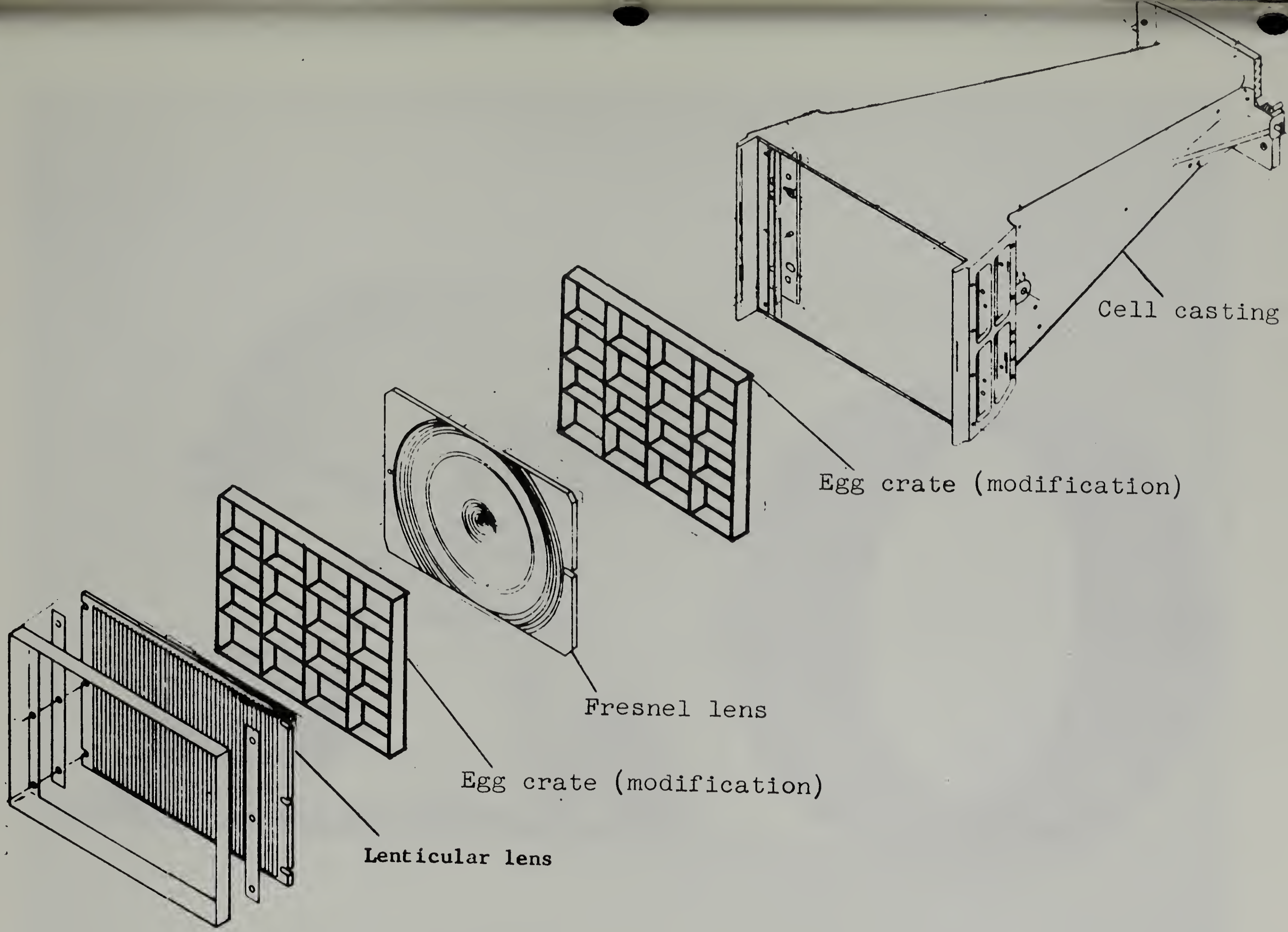
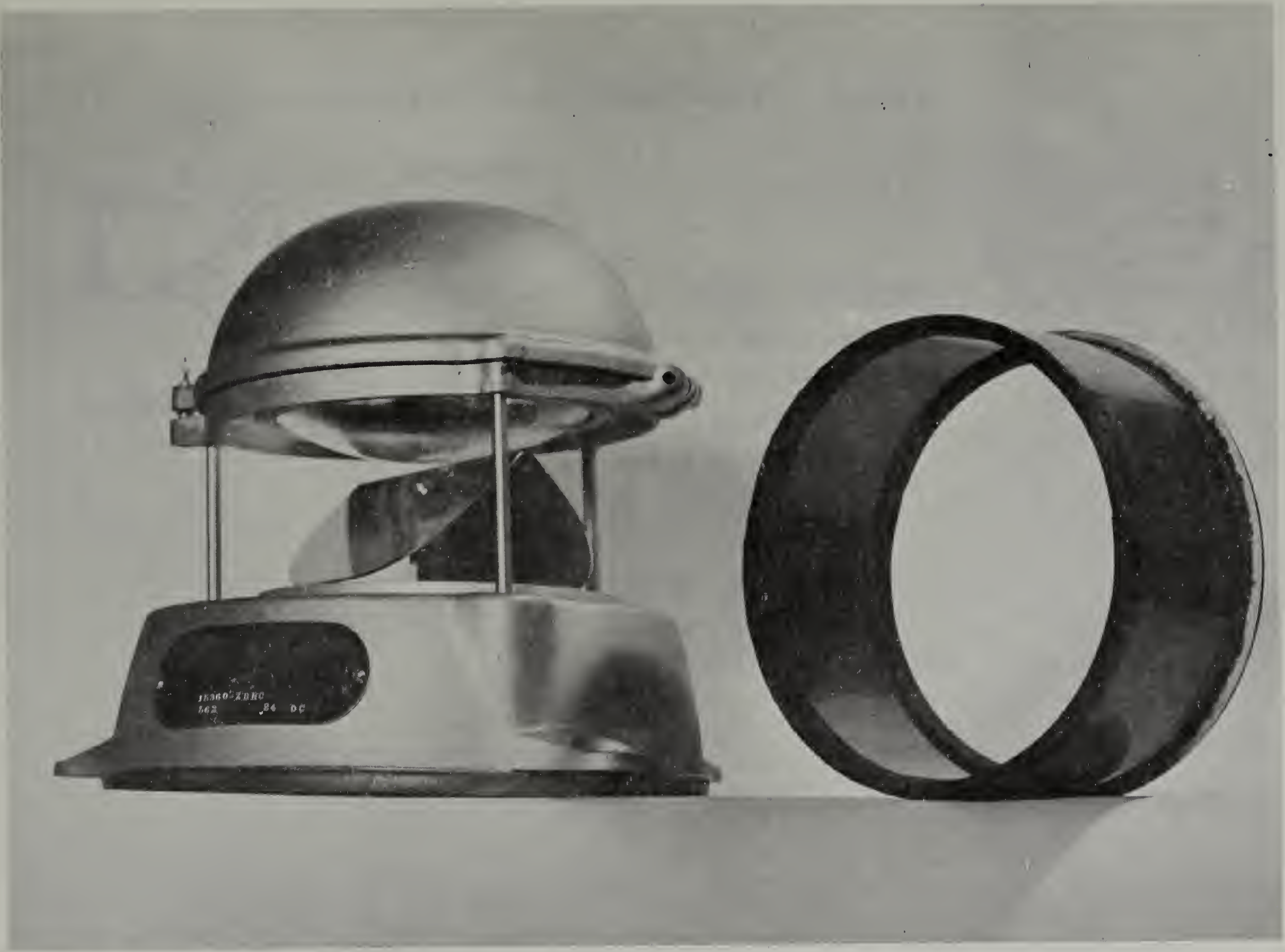


Figure 15



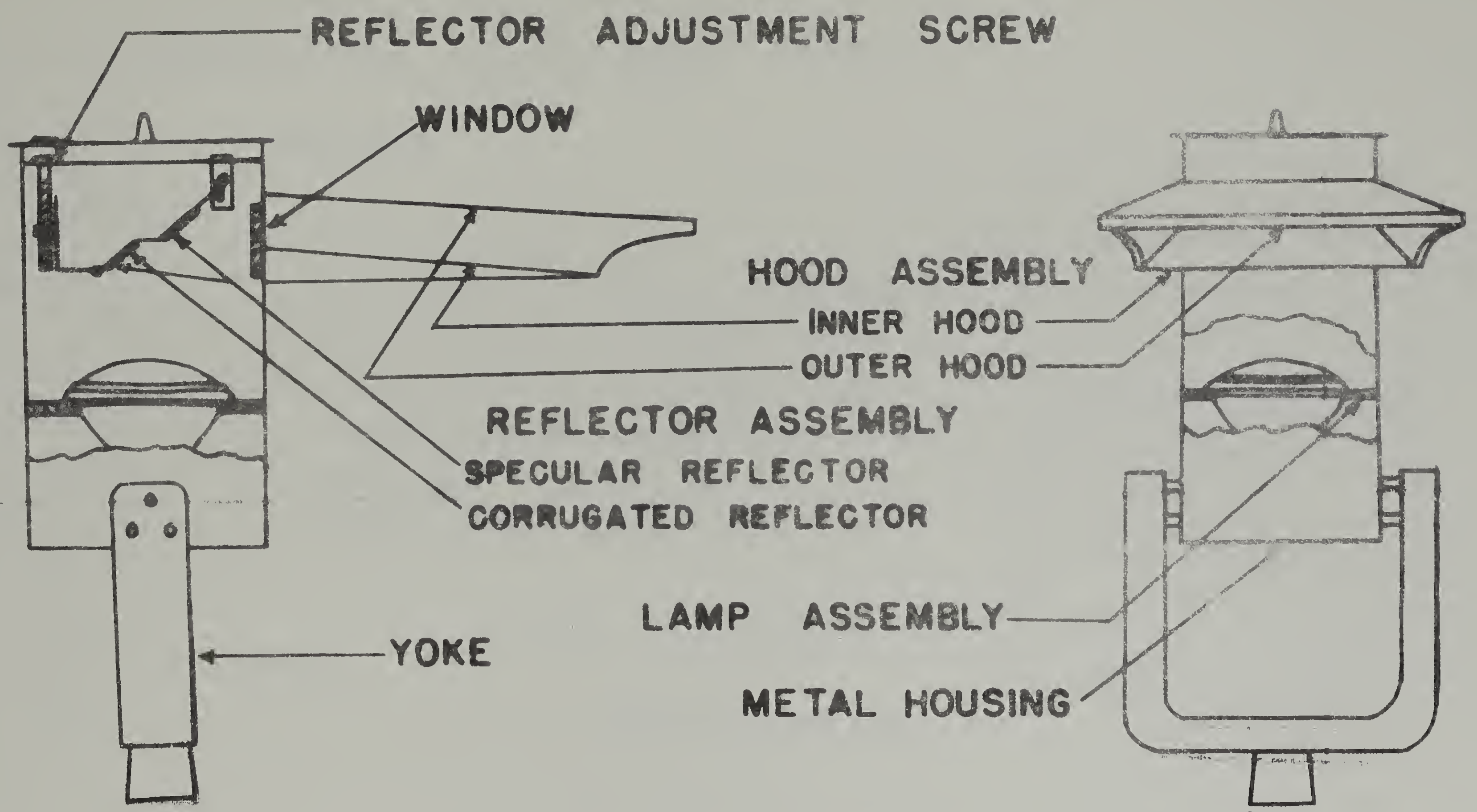
Partial lens cell assembly, exploded view showing "egg crate" lens restraining device, of the Fresnel-Lens Optical Landing System.

Figure 16



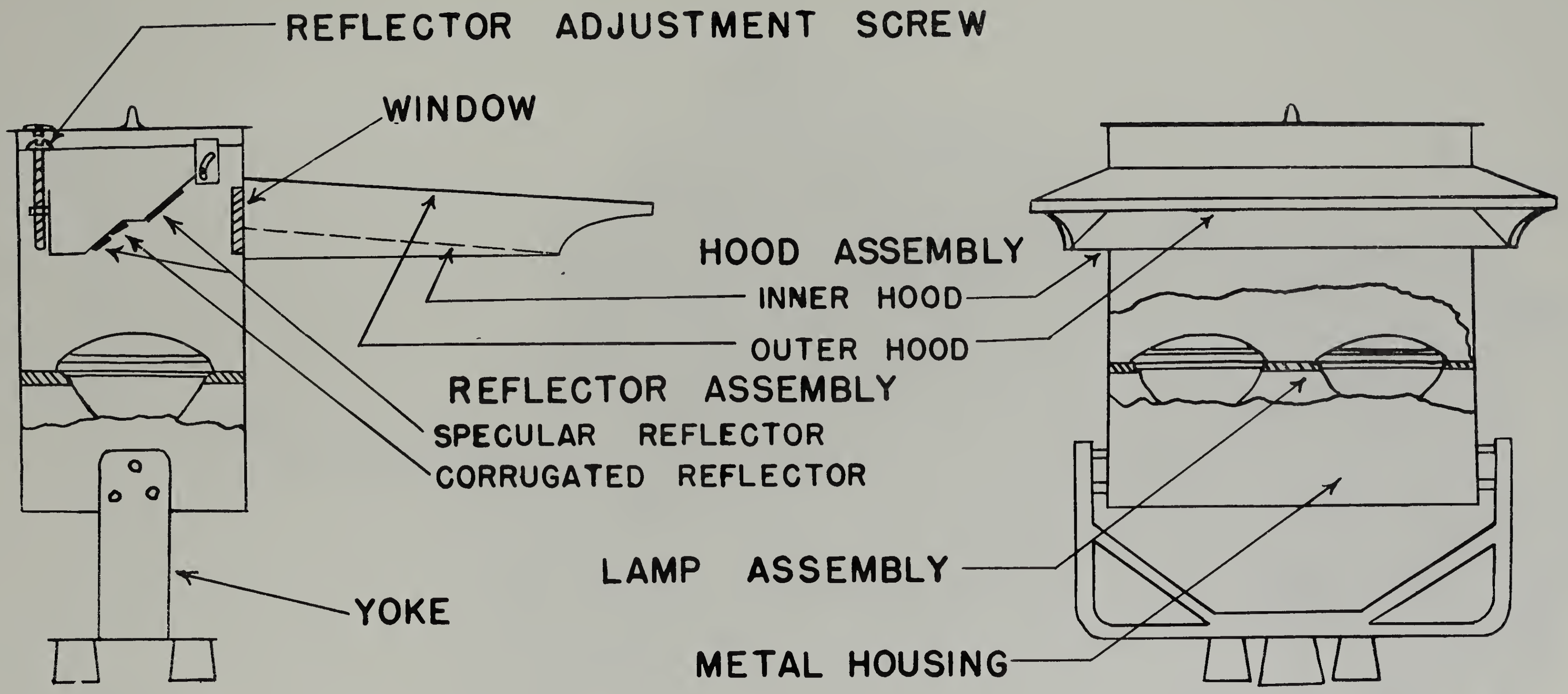
Carrier homing beacon.

Figure 17

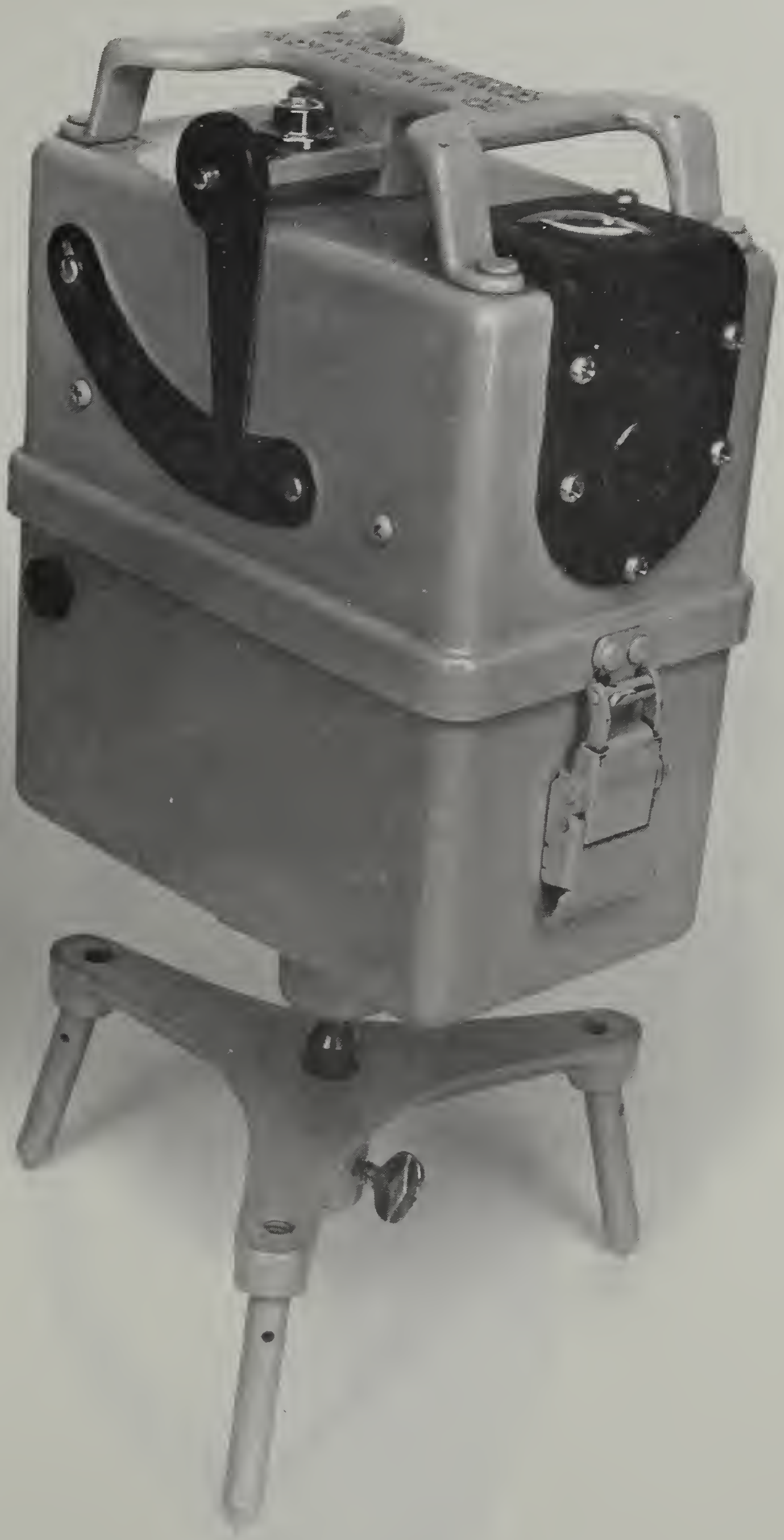


Schematic diagram of the "Night Vision Flood Light" types 325-A and 326-A

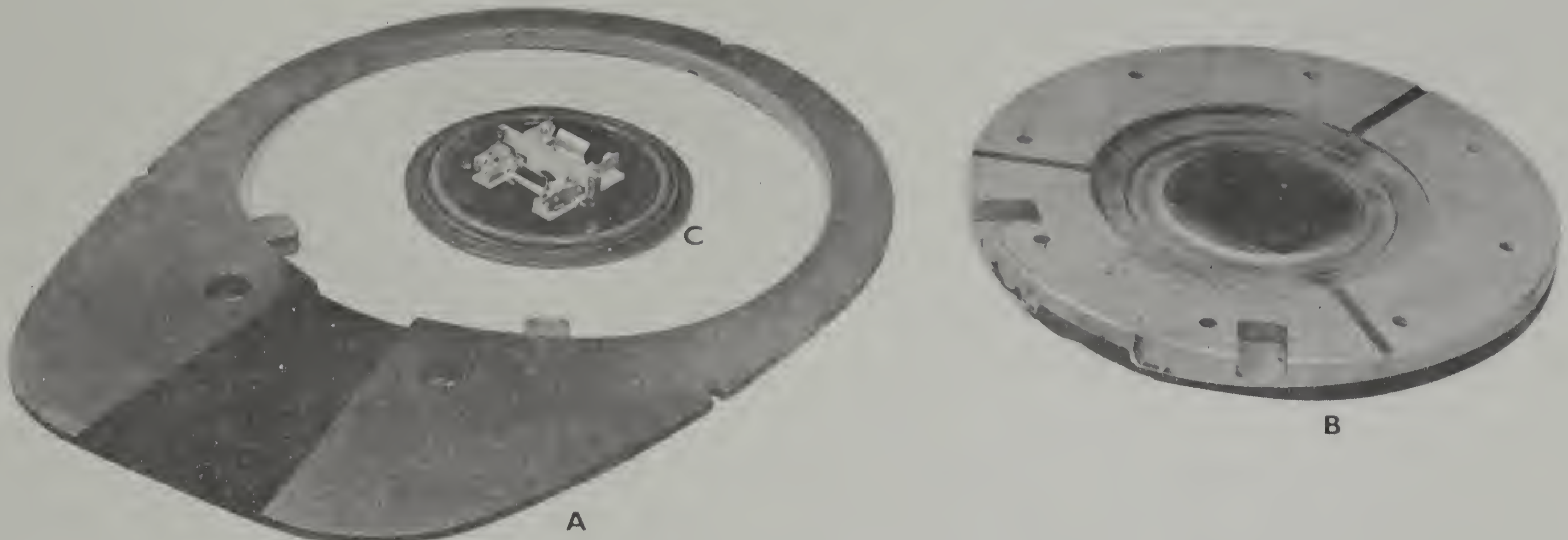
Figure 18



Schematic diagram of the "Night Vision Flood Light" types 328-A and 329-A



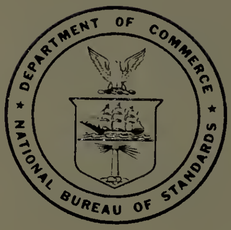
NBS Report 9350 Supplementary Battery operated AA-1 glide slope indicator. Figure 20



A. Shear Ring Assembly
B. Guard Assembly
C. Baseplate (lamps omitted)

Deck guide light, L.C.D.Co. No. 366

Figure 21


DEPARTMENT OF COMMERCE ★ NATIONAL BUREAU OF STANDARDS ★